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ABSTRACT

Retroactive inhibition, a loss of memory due to learning other materials between recall and exposure to the original materials, was investigated in relation to prose. Two variables were manipulated in the study: similarity of interpolated stories (dissimilar or similar), and the response requirements (completion-recall or multiple-choice). The 190 students in introductory psychology courses who participated as subjects in the study were randomly assigned to a treatment group; they were given an original and two interpolated stories (which could be similar, both be dissimilar, the first similar while the second dissimilar, or the first dissimilar and the second similar) to read, and tested on (completion or multiple-choice) material contained in the original story. Results showed that retroactive inhibition in prose is greater when interpolated passages are similar to the original passage. Further analyses indicated that when the similar story is the first interpolated story, the same percentage of total errors result from interjections from that story as when it is last. Finally, the subjects responded correctly more often on the multiple-choice test than on the completion test, and tended to make different kinds of errors on the two tests. (SH)

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RESPONSE REQUIREMENT AND NATURE OF INTERPOLATED STORIES IN RETROACTIVE INHIBITION IN PROSE[1]

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Print-one of the most popular classroom media today and in decades past-still poses problems. Critical questions arise concerning the most effective conditions for learning from print. One especially important question for every reader of printed prose involves the circumstances under which retroactive inhibition (RI) occurs. Retroactive inhibition may be defined as that loss of memory due to learning other materials between exposure to the original materials and recall.

Investigations into prose learning for RI have yielded conflicting results. Ausubel and others (Ausubel et al., 1957, 1968) found little evidence of its existence. Other investigators found the opposite (cf., Slamecka, 1960, 1962; Anderson and Myrow, 1971; Crouse, 1970, 1971). The disparity in findings, however, may be attributed to differences in (1) the similarity of the interpolated learning materials, (2) the general nature of the learning materials (general vs. specific; familiar vs. unfamiliar), and (3) the nature of the responses required. Past research generally indicates that the more similar the interpolated materials are to the original learning materials, the more specific the learning materials, and the more difficult the response requirements (recall is a more difficult response than recognition), the greater the effect on RI.

Crouse (1970) showed that RI occurred when the relationship between

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the interpolated learning task and the original learning task was such that questions on the test could be designed so that a reply from either task fit in. In a second study (Crouse, 1971), the amount of similarity between the original and interpolated tasks was varied. The interpassage similarity influenced RI.

Anderson and Myrow (1971) also found RI where the original passage and the interpolated passage were similar. In addition, they varied response requirements and found the RI effect to be greater when subjects responded to multiple choice (MC) questions than when they responded to short answer (SA) questions. They hypothesized that this was due to response competition, the MC questions offering several likely answers. It appears likely, however, that when the stems of two SA questions are very similar, response competition will occur in SA questions as well because the possible alternatives for each of the stems begin to compete. In fact, response competition may even be greater when subjects have to generate responses than when the task is to recognize the correct response.

The present study is a further examination of the conditions under which retroactive inhibition occurs in prose. The two variables manipulated are the similarity of the interpolated stories (similar vs. dissimilar) and the response requirements (recall vs. recognition).

Method

The subjects were 190 students enrolled in educational psychology courses at two large universities, a state university in the midwest and a

private university in the intermountain west. Subjects were randomly assigned to one of eight treatment groups in a 2 x 4 factorial design, the factors being Response Requirements and Nature of Interpolated Passages.

Each subject read the original story which was a brief biography, dense with facts, and two interpolated stories, whose nature differed across treatments. In four cells, one similar and one dissimilar interpolated story was given in both possible sequences (labelled DS and SD); in two cells the interpolated stories were both dissimilar (DD), and in two cells both stories were similar (SS). After the subjects had read the three stories, a test was given covering the material contained in the original story. Half the subjects were tested in a multiple-choice format and the other half in a short answer essay format.

The learning passages were the same as those used by Crouse (1971). The original learning passage was a 212 word biographical sketch about a hypothetical person, John Payton, in which the first two sentences were: "Payton was born in Hampstead at the end of October, 1795. When he was only eight years of age, his father, who kept a livery stable, was killed by a fall from a horse."

The two similar passages used were generated from the original passage, with specific facts such as the name of the person, dates, cities, and details of events changed. For example, the first two sentences from each of the similar passages were: "Fowler was born

in Liverpool at the end of October, 1810. When he was only five years of age, his father, who was a servant, was killed by a robber," and "Hughes was born in Paddington at the end of October, 1805. When he was only nine years of age, his father, who was a weaver, was killed in a swimming accident."

The two dissimilar passages were descriptions of an island and a library. The two first sentences describing the island were: "Karisoon (population 29,723) is an island whose main attraction is recreation. Even though it is a small island, its many inlets give it a tidal coast of 1,057 miles." The first two sentences of the library passage were: "King Library is particularly well stiuated being in the upper section of beautiful Northwest Park. Each year the library is host to several art exhibits, the largest being the Kenwood exhibit."

Two tests differing only in the type of response they required, were used to measure how much students remembered of the information presented in the original story. The stems of the questions were identical for both tests. The SA test presented only the stem of each question and required subjects to generate and write a short response. The MC test presented the stem of each question and five alternative responses. One alternative was the correct answer, two alternatives were from the similar stories and reflected the parallel information presented in those stories, and the other two alternatives were from the dissimilar stories, if possible, or were generated to be similar to the other three responses

when it was not possible to select a name, date or event from the dissimilar stories. For example, the alternative answers presented for the question "Payton was born in what city?" were: Hampstead (the correct answer), Liverpool (where Fowler was born), Paddington (where Hughes was born), Cadorus (the name of a lake on Karisoon), and Northwark (the name of a park by King Library).

The data for analysis were the number of correct answers and the number of specific type of errors made. Two types of errors were of primary interest-omissions (no response) and interjections (responding with an incorrect answer from another story).

Results

The main effect for Response Requirements was significant ($F_{(1,181)} = 153.67$, $p < .001$) with the mean number correct for subjects taking the MC test at 15.05 of 22 possible. The corresponding mean for the subjects taking the SA test was 8.78.

The main effect for the Nature of Interpolated Passages was also significant ($F_{(3,181)} = 7.46$, $p < .01$) when the number correct was analyzed. Subjects scored highest ($\bar{x} = 14.18$) in the DD condition. The SD condition was next highest ($\bar{x} = 12.34$) with the DS and SS conditions the lowest ($\bar{x}$'s = 10.62 and 10.5, respectively). The following comparisons were significantly different at the .05 level or beyond: DD>SD>DS & SS. The DS and SS conditions were not significantly different. The interaction of Response Requirement by

Nature of Interpolated Passages was not significant.

When the number of interjections was analyzed it was clear that subjects were more likely to select information from one of the interpolated stories as the answer in the MC test than they were to generate such information as an answer for the SA test ($\bar{x}$'s = 3.19 and .91, respectively; $F_{(1,181)} = 230.20$, $p < .001$). The interjections were from the similar interpolated passages significantly more often than from the different interpolated passages. ($F_{(1,181)} = 9.45$, $p < .01$). When the number of omissions was analyzed, the opposite was found, with subjects more likely to omit answers in the SA test than on the MC test ($\bar{x}$'s = 7.70 and 1.08, respectively; $F_{(1,181)} = 223.49$, $p < .001$). Again, the interaction of Response Requirement by Nature of Interpolated Passages was not significant.

The number of interjections from each story was also analyzed. In the DD condition, 5 percent of the total errors were interjections from the first story and 2 percent were from the second story. For SS subjects 13 percent of the errors were from the first story and 10 percent from the second. In the DS condition 4 percent were from the first story and 16 percent came from the second. And in the SD the percentage of errors were 17 and 3 respectively.

Discussion

The finding that retroactive inhibition (RI) in prose is greater when

the interpolated passages are similar to the original passage than when they are dissimilar supports the findings of Crouse (1970, 1971) and Anderson and Myrow (1971). Further information was gathered from the administration of the SS, SD and DS treatments. Factors such as the length of time spent on the similar materials and the position of the similar passage-immediately after the original passage or immediately before the test-had an effect on RI. Since the scores for SS and DS groups were not significantly different and both the SS and DS groups scored significantly lower than the SD group, it appears that it was not the number of similar passages that had an effect, but rather how close they were to the test. The results of analyses of percentage of errors, however, indicate that while the placement of the similar story affects the total number of errors, it does not affect the percentage of errors which result from the similar story. That is, when the similar story is first, the same percentage of total errors result from intrusions from that story as when it is last.

That the subjects responded correctly more often on the MC test than on the SA test is similar to the pattern found by Anderson and Myrow. In fact, subjects recalled approximately 40 percent of the correct answers on the SA test just as in the Anderson and Myrow study (1971, p. 87), and 68 percent of the correct answers on the MC test, a figure slightly higher than for the corresponding subjects in the Anderson

and Myrow study. In the present study, the foils for the MC questions were chosen from similar passages and, when possible, from the dissimilar passages. Subjects who received at least one similar interpolated passage responded with interjections from the similar passages at least 50 percent of the times they were wrong. In comparison, only 7 percent of the wrong responses generated on the SA tests were interjections from the similar passages. Only 14 percent of the interjections on the MC test were from the different passage. On the other hand, approximately 60 percent of the errors on the SA test were due to omissions, while only 14 percent of the incorrect responses on the MC test were omissions. The foils on the MC tests which were from the similar passages appeared to compete with the correct responses while the foils from the different passages did not. In fact, subjects were as likely to omit answers on the MC test as they were to select a foil from the different passages. On the SA test most of the items missed were not even overtly attempted. While the reason for these omissions is not entirely clear, perhaps interference from the similar passages caused sufficient confusion that subjects chose not to respond at all. Perhaps no interference occurred and the difference between the MC and SA test scores is due to the relative difficulty of the two responses. Or the results may be due to the set of many students for guessing on multiple choice items they do not know, but not guessing on similar short answer items.

In summary, this experiment shows that both the similarity of the interpolated passages and the response requirements affect retroactive inhibition in prose materials. The more closely the test on the original passage follows the similar passage, the more pronounced its effect. Subjects responding to an MC test will select more correct answers than correct answers will be generated by the subjects on an SA test. The questions missed on the MC test will most likely be caused by interference from the similar passage foils while the questions missed on the SA test will most likely come from omissions.

REFERENCES

Anderson, R.C. and Myrow, D.L. Retroactive inhibition of meaningful discourse. Journal of Educational Psychology, 1971, 62, 81-94.

Ausubel, D.P., Robbins, L.C., and Blake, E. Retroactive inhibition and facilitation in the learning of school materials. Journal of Educational Psychology, 1957, 48, 334-343.

Ausubel, D.P., Stager, M., and Gaite, A.J.H. Retroactive facilitation in meaningful verbal learning. Journal of Educational Psychology, 1968, 59, 250-255.

Crouse, J.H. Transfer and retroaction in prose learning. Journal of Educational Psychology, 1970, 61, 226-228.

Crouse, J.H. Retroactive interference in reading prose materials. Journal of Educational Psychology, 1971, 62, 39-44.

Slamecka, N.J. Retroactive inhibition of connected discourse as a function of practice level. Journal of Experimental Psychology, 1960, 59, 104-108.

Slamecka, N.J. Retention of connected discourse as a function of duration of interpolated learning. Journal of Experimental Psychology, 1962, 63, 480-486.

FOOTNOTES

[1]This study was presented as a paper at the annual convention of the Association for Educational Communication and Technology, Minneapolis, Minnesota, 1972.